

# Purchase Order Receipt Listing

Wednesday, May 10, 2017 3:34:31 PM

All amounts are calculated in domestic currency.

All Vendors PO ID PO36183 Receipt Dates from 5/9/2017 to 5/9/2017 All Line Item Types

All Item ID/GL/WOs All Rec. Employees All Currencies

Grouped by Vendor ID

Purchase Order ID/ Curr Type	Line Nbr/ Insp Req	Project ID	Reference/ Description/ Cert Std	PO U/M / Stock U/M	Required Date Required Qty	Recv Date/ Recv Emp	Recv Qty (PO U/M)	Cost Per Unit/ Recv Value	Inspected Qty/ Rejected Qty (PO U/M)	MRB Qty/ MRB Reject Qty	Book Amt
PO36183 USD	1	✓	M304TR0.375W.065 f 304 RD Tube .375 x .065W m137477	5/9/2017 20.0000	5/9/2017 PLOU01	20.0000	✓	0.0000	0.0000	0	\$0.00
	2	✓	M304TR0.750W.049 f 304 RD Tube .750 x .049W m137477	5/9/2017 60.0000	5/9/2017 PLOU01	60.0000	✓	0.0000	0.0000	0	\$0.00
	3	✓	M4130NT0.500W.08 f 4130 RD tube .500 x .083W m137477	5/9/2017 40.0000	5/9/2017 PLOU01	40.0830	✓	0.0000	0.0000	0	\$0.00
	4	✓	M4130NT0.750W.04 f 4130 RD Tube .750 x .049W m137477	5/9/2017 20.0000	5/9/2017 PLOU01	23.9170	✓	0.0000	0.0000	0	\$0.00
	5	✓	M6061T6T0.375W.05 f 6061-T6 RD Tube .375 x.058W m137477	5/9/2017 200.0000	5/9/2017 PLOU01	204.0000	✓	0.0000	0.0000	0	\$0.00
	6	✓	M6061T6T0.625W.12 f 6061-T6 RD Tube 0.625 X.125W m137477	5/9/2017 20.0000	5/9/2017 PLOU01	24.0000	✓	0.0000	0.0000	0	\$0.00
	7	✓	M6061T6T0.3125W.0 f 58 ALUM TUBE .3125 x .058w m137477	5/9/2017 120.0000	5/9/2017 PLOU01	120.0000	✓	0.0000	0.0000	0	\$0.00

Purchase Order ID/ Curr Type	Line Nbr/ Insp Req	Project ID	Reference/ Description/ Cert Std	PO U/M / Stock U/M	Required Date Required Qty	Recv Date/ Recv Emp	Recv Qty (PO U/M)	Cost Per Unit/ Recv Value	Inspected Qty/ Rejected Qty (PO U/M)	MRB Qty/ MRB Reject Qty	Book Amt
Vendor ID	Vendor Name	VU-TWMM001	TW Metals								
PO36183	9		71401-45		5/9/2017	5/9/2017	1.0000		0.0000	0	\$0.00
USD	No		PROCUREMENT QUALITY CLAUSES m137477		1.0000	PLOU01			0.0000	0	
Total Received Quantity:											
Total Qty to Inspect (PO U/M):											
Total Reject Quantity:											
Total Receipt Value:											
Total Balance Due Quantity:											
493.0000											
0.0000											
0.0000											
\$0.00											
0.0000											



O'Neal High-Performance Metals Group



Packing Slip

ORDER NO.: 60631135

FROM: CRAN

PAGE 1

CUST NUMBER: 1203820 NET WGT: 68.424 REQ.DATE: 05/09/17 CONFIRMED  
SOLD TO: SHIP TO:  
DART AEROSPACE LTD DART AEROSPACE LTD  
1270 ABERDEEN ST 1270 ABERDEEN ST  
HAWKESBURY ON HAWKESBURY ON  
CANADA CN K6A 1K7 ONTARIO CANADA CN K6A 1K7

SALESPERSON: DONNA SMALLEY SHIP BY: 05/04/17  
TERMS: NET 30 DAYS VIA: COMMON CARRIER  
F.O.B.: SHIPPING POINT FREIGHT: PREPAID  
CUST ORD NO.: PO36183 RELEASE NO.:  
RECEIVING PHONE:

LINE ITEM DESCRIPTION WIDTH LENGTH  
0001 36311 SMLS CD 304/L A269 3/8 OD X .065 WA 20' ML

CLN#	ORD QTY	INVOICE QTY	SHIPPED QTY	WT	PCS
	20.000 FT	20.000 FT	20.000 FT	4.303	1

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

ECCN: 2B999.g Export License: NLR Expiration Date: 0/00/00  
PO:49329273 HT:YX1410664 PC: 1 CUSTOMER QTY: 20.000 UOM FT  
MLT:CHINA MFG:CHINA SLB/CL:4-34

0002 36860 SMLS CD 304/L A269 3/4 OD X .049 WA 20' CL

CLN#	ORD QTY	INVOICE QTY	SHIPPED QTY	WT	PCS
	60.000 FT	60.000 FT	60.000 FT	22.003	3

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

ECCN: 2B999.g Export License: NLR Expiration Date: 0/00/00  
PO:49342471 HT:YX1501783 PC: 3 CUSTOMER QTY: 60.000 UOM FT  
MLT:CHINA MFG:CHINA SLB/CL:11-63

0003 32821 SMLSCD 4130 6736 1/2 X .083 WA 17/24 FT

CLN#	ORD QTY	INVOICE QTY	SHIPPED QTY	WT	PCS
	20.000 FT	20.083 FT	20.083 FT	7.423	1

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

ECCN: 9A991.d Export License: NLR Expiration Date: 0/00/00  
PO:49362520 HT:253636 PC: 1 CUSTOMER QTY: 20.083 UOM FT  
MLT:GERMANY MFG:GERMANY SLB/CL:1632158

THANK YOU FOR THIS ORDER

TERMS AND CONDITIONS APPLICABLE TO THE SALE OF THESE  
PRODUCTS ARE SET FORTH ON OUR WEBSITE FOR YOUR CAREFUL  
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<http://www.twmetals.com/invoice-terms.html>

827-59



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Packing Slip

ORDER NO.: 60631135

FROM: CRAN

PAGE 2

CUST NUMBER: 1203820 NET WGT: 68.424 REQ.DATE: 05/09/17 CONFIRMED  
SOLD TO: SHIP TO:  
DART AEROSPACE LTD DART AEROSPACE LTD  
1270 ABERDEEN ST 1270 ABERDEEN ST  
HAWKESBURY ON HAWKESBURY ON  
CANADA CN K6A 1K7 ONTARIO CANADA CN K6A 1K7

SALESPERSON: DONNA SMALLEY SHIP BY: 05/04/17  
TERMS: NET 30 DAYS VIA: COMMON CARRIER  
F.O.B.: SHIPPING POINT FREIGHT: PREPAID  
CUST ORD NO.: PO36183 RELEASE NO.:  
RECEIVING PHONE:

LINE ITEM DESCRIPTION WIDTH LENGTH  
0004 33047 CDS 4130 6736 3/4 X .049 17/24 FT

CLN# ORD QTY INVOICE QTY SHIPPED QTY WT PCS  
20.000 FT 23.917 FT 23.917 FT 8.771 1

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

ECCN: 9A991.d Export License: NLR Expiration Date: 0/00/00  
PO:49355846 HT:251554 PC: 1 CUSTOMER QTY: 23.917 UOM FT  
MLT:GERMANY MFG:GERMANY SLB/CL:1627804

9-89

0005 41952 D6061-T6 3/8 OD X .058 WA 12 FT ML

CLN# ORD QTY INVOICE QTY SHIPPED QTY WT PCS  
200.000 FT 204.000 FT 204.000 FT 13.831 17

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

ECCN: EAR99 Export License: NLR Expiration Date: 0/00/00  
PO:49361230 HT:1180968 PC: 17 CUSTOMER QTY: 204.000 UOM FT  
MLT:UNITED STATES MFG:UNITED STATES SLB/CL:438268

0006 42588 D6061-T6 5/8 OD X .125 WA 12 FT ML

CLN# ORD QTY INVOICE QTY SHIPPED QTY WT PCS  
24.000 FT 24.000 FT 24.000 FT 5.541 2

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

ECCN: EAR99 Export License: NLR Expiration Date: 0/00/00  
PO:49360917 HT:F002299760001 PC: 2 CUSTOMER QTY: 24.000 UOM FT  
MLT:UNITED STATES MFG:UNITED STATES SLB/CL:221973

9-89

SP17-510

THANK YOU FOR THIS ORDER

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PAGE 3

CUST NUMBER: 1203820 NET WGT: 68.424 REQ.DATE: 05/09/17 CONFIRMED  
 SOLD TO: SHIP TO:  
 DART AEROSPACE LTD DART AEROSPACE LTD  
 1270 ABERDEEN ST 1270 ABERDEEN ST  
 HAWKESBURY ON HAWKESBURY ON  
 CANADA CN K6A 1K7 ONTARIO CANADA CN K6A 1K7

SALESPERSON: DONNA SMALLEY SHIP BY: 05/04/17  
 TERMS: NET 30 DAYS VIA: COMMON CARRIER  
 F.O.B.: SHIPPING POINT FREIGHT: PREPAID  
 CUST ORD NO.: PO36183 RELEASE NO.:  
 RECEIVING PHONE:

LINE	ITEM	DESCRIPTION	WIDTH	LENGTH
0007	41723	D6061-T6 5/16 OD X .058 WA		12 FT ML

CLN#	ORD QTY	INVOICE QTY	SHIPPED QTY	WT	PCS
	120.000 FT	120.000 FT	120.000 FT	6.552	10

\*\* 1 TEST REPORTS REQUIRED \*\*  
 \*\* 1 CERTS REQUIRED \*\*

ECCN: EAR99 Export License: NLR Expiration Date: 0/00/00  
 PO:49354489 HT:388604 PC: 4 CUSTOMER QTY: 48.000 UOM FT  
 MLT:UNITED STATES MFG:UNITED STATES SLB/CL:422327  
 PO:49367859 HT:1892697 PC: 6 CUSTOMER QTY: 72.000 UOM FT  
 MLT:UNITED STATES MFG:UNITED STATES SLB/CL:450154

BROKERS KUEHNE AND NAGEL LTD

AREA		TYPE OF PKG	PKGS	GRS WEIGHT	WIDTH	LENGTH	HGHT
B		REDDICRATE	1.000	107.000		24.5000	
			1.000	107.000			

BY: TB  
 RT 000-

UNLOAD TYPE: NONE SPECIFIED

DATE SHIPPED \_\_\_\_\_

DATE FILLED \_\_\_\_\_

THANK YOU FOR THIS ORDER

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Slip

ORDER NO.: 60631158

FROM: CRAN

PAGE 1

CUST NUMBER: 1203820 NET WGT: 7.392 REQ.DATE: 05/09/17 CONFIRMED  
SOLD TO: SHIP TO:  
DART AEROSPACE LTD DART AEROSPACE LTD  
1270 ABERDEEN ST 1270 ABERDEEN ST  
HAWKESBURY ON HAWKESBURY ON  
CANADA CN K6A 1K7 ONTARIO CANADA CN K6A 1K7

SALESPERSON: DONNA SMALLEY SHIP BY: 05/04/17  
TERMS: NET 30 DAYS VIA: COMMON CARRIER  
F.O.B.: SHIPPING POINT FREIGHT: PREPAID  
CUST ORD NO.: PO36183 ADD RELEASE NO.:  
RECEIVING PHONE:

LINE	ITEM	DESCRIPTION	WIDTH	LENGTH
0001	32821	SMLSCD 4130 6736 1/2 X .083 WA		17/24 FT

CLN#	ORD QTY	INVOICE QTY	SHIPPED QTY	WT
	20.000 FT	20.000 FT	20.000 FT	7.392

PCS  
1

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

ECCN: 9A991.d Export License: NLR Expiration Date: 0/00/00  
PO:49362520 HT:253636 PC: 1 CUSTOMER QTY: 20.000 UOM FT  
MLT:GERMANY 9 MFG:GERMANY SLB/CL:1632158

BROKERS KUEHNE AND NAGEL LTD

AREA	TYPE OF PKG	PKGS	GRS WEIGHT	WIDTH	LENGTH	HGHT
B	DOUBLE CARTON	1.000	27.000		248.0000	
		1.000	27.000			

BY: TW  
RT 000-

UNLOAD TYPE: NONE SPECIFIED

DATE SHIPPED

DATE FILLED

THANK YOU FOR THIS ORDER

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Packing  
Slip

ORDER NO.: 60631135

FROM: CRAN

PAGE 4

CUST NUMBER: 1203820 NET WGT: 68.424 REQ.DATE: 05/09/17 CONFIRMED  
SOLD TO: SHIP TO:  
DART AEROSPACE LTD DART AEROSPACE LTD  
1270 ABERDEEN ST 1270 ABERDEEN ST  
HAWKESBURY ON HAWKESBURY ON  
CANADA CN K6A 1K7 ONTARIO CANADA CN K6A 1K7  
  
SALESPERSON: DONNA SMALLEY SHIP BY: 05/04/17  
TERMS: NET 30 DAYS 27 ENGLEHARD DRIVE  
F.O.B.: SHIPPING POINT MONROE TWP NJ 08831  
CUST ORD NO.: PO36183  
VIA: COMMON CARRIER  
FREIGHT: PREPAID  
RELEASE NO.:  
RECEIVING PHONE:

"TW Metals MSDS data is available on our web site at [www.twmetals.com](http://www.twmetals.com). MSDS data can be found under the Technical Resources Tab, Product Statistics & Data and the TW Metals MSDS's heading. If you do not have web site access you may telephone 610-458-1300 and we will mail or fax a copy of our current MSDS data to your location."

"CERTIFICATE OF CONFORMANCE"

"TW Metals certifies that the material supplied on this purchase order and contained in the heat/lot number referenced above has been manufactured, inspected, and tested in accordance with the material specification. These records are on file at TW Metals. Packaging material for shipments to Europe and China consists of manufactured wood products and complies with the European emergency measures for coniferous non-manufactured wood packing material"

Authorized Test Report Clerk Cornelie Date: 5/04/17

These commodities have been exported from the United States in accordance with the U.S. export control laws, export administrations regulations. Diversion contrary to U.S. law prohibited.

THANK YOU FOR THIS ORDER

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Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666

# BENTELER

Steel/Tube

## ABNAHMEPRÜFZEUGNIS EN 10204-3.1 INSPECTION CERTIFICATE EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1 EN 10204:2005-01

Benteler Steel/Tube GmbH - Postfach 1340 - 33043 Paderborn - Deutschland

TW Metals  
The Aboretum, Suite 204  
760 Constitution Drive  
EXTON PA 19341  
USA

Dokument-Nr.: 41 991327/001/P  
Document No.:  
No. du document:

Kunden-Bestell-Nr.: 46004784-TW M49362520  
Purchase Order No.:  
No. de commande du client:

Benteler Auftrags-Nr.: 1632158  
Benteler Order No.:  
No. de commande Benteler:

Versandanzeigen-Nr.: 4185829  
Dispatch Note No.:  
No. d'avis d'expédition:

Produkt: NAHTLOSE STAHLROHRE  
Product: SEAMLESS STEEL TUBES  
Produit: TUBES D'ACIER SANS SOUDURE

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

Hersteller: Warmrohrwerk/Zleherei  
Manufacturer: IDIN EN ISO 9001, ISO/TS-16949 CERTIFIED BY TÜV NORD CERT  
Producteur: IPED 2014/68/EU CERTIFIED BY TÜV NORD SYSTEMS

Herstellerzeichen:  
Manufacturer's brand:  
Marque du producteur:

Stempel des Abnahmebeauftragten: WA  
Stamp of the inspection representative:  
Poinçon du contrôleur:

Stahlschmelzungsverfahren: ELEKTROSTAHL  
Steelmaking process: ELECTRIC FURNACE  
Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

Lieferbedingungen: AMS-T-6736B-08 Type 1, ASTM-A 519-2006, MIL-T-6736B Type 1, AMS6360 Rev. M, AMS 2301K

Terms of delivery:  
Conditions de livraison:

Masse - Toleranzen: straightness acc. to customer request, AMS 2253E-83, Aircraft Type, Seamless, Cold Finished

Dimensions-tolerances:  
Dimensions-tolérances:

Stahlsorte: GRADE 4130

Steel grade:  
Nuance d'acier:

Lieferzustand: Condition N

Delivery condition:  
État de livraison:

Produktkennzeichnung: FSD: BENTELER AMS6360M-AMS-T-6736 B 1-MIL-T-6736 B 1-AMS 2301K 4130 Condition N HEAT-NO.

Product marking: CD AQ S DIMENSIONS WA GERMANY

Marquage du produit:

AZ = Ätzfärbemittel, Etching ink marking, Gravure à l'encre . FK = Farbbrennzeichnung, color marking, marquage par couleur . FS = Farbschablonierung, paint stencilling, marquage par peinture . FSD = Farbschablonierung, Color Jet printer, Imprimante à jet d'encre de couleur . LK = Laserkennzeichnung, Laser marking, Marquage laser . PKE = Etikettenkennzeichnung, tag marking, marquage sur étiquette . PS = Prägestempel, die stamp, marquage par poinçonnage . TS = Tintenstrahlkennzeichnung, ink jet spray marking, imprimante à jet d'encre .



1/4

Benteler Steel/Tube GmbH  
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33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666

**BENTELER**  
Steel/Tube

**ABNAHMEPRÜFZEUGNIS EN 10204-3.1**  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 41-991327/001/P  
Document No.:  
No. du document:

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

Blatt: 2 / 4  
Page:

Pos.	Stück	Maße	Gesamtlänge	Gewicht	Schmelzen-Nr.	Prüfdruck	Rohr-Nr.-Gruppe	Vielfachlängen
Item	Number	Dimensions	Length total	Weight	Heat No.	Test pressure	Tube number group	Multiple lengths
Poste	Nombre	Dimensions	Longueur totale	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multiples

0008	125	0.500" O.D. * 0.083" WT. 20 FT - 24 FT	2500,56	926	253636			
------	-----	---	---------	-----	--------	--	--	--

**Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]**

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU
Item	Heat No.									
Poste	No. de coulée									

0008	253636	0,320	0,270	0,57	0,008	0,001	0,88	0,17	0,09	0,14
------	--------	-------	-------	------	-------	-------	------	------	------	------

**Produktanalyse [%] / Product analysis [%] / Analyse sur produit [%]**

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU
Item	Heat No.									
Poste	No. de coulée									

0008	253636	0,310	0,280	0,55	0,012	0,002	0,88	0,17	0,09	0,15
------	--------	-------	-------	------	-------	-------	------	------	------	------

**Prüfergebnisse / Test results / Résultats des essais**

Die Rohre wurden zerstörungsfrei geprüft:  
The tubes are non destructive tested:  
Les tubes ont passé un essai non destructif:

ET-test: acc. to ASTM-A 450; ET - Test method: acc. to ASTM-E 309; for imperfections;  
ET-test: ET with rotating pancake coils; according to EN 10246-3; imperfections;  
Notch depth: 0,30 mm; notch width < = notch depth; notch length min. 2 x transducer width (max. 50 mm)

Augensichtkontrolle:	PASSED	Materialverwechslungsprüfung:	PASSED	Maßkontrolle:	PASSED
Visual inspection:		Material conformity test:		Dimensions examination:	
Examen visuel:		Vérification de la nuance:		Vérification des dimensions:	

**Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques**

Die Probenahme erfolgte an Vielfachlängen.  
The sampling was carried out on multiple lengths.  
L'échantillonnage était réalisé aux longueurs multiples.



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**BENTELER**  
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1 Dokument-Nr.: 41-991327/001/P Blatt: 3 / 4  
INSPECTION CERTIFICATE EN 10204-3.1 Document No.: No. du document: Page:  
CERTIFICAT DE RECEPTION EN 10204-3.1

Zugversuch längs bei RT, Vollprobe / Tensile test longitudinal at RT, Full section test specimen / Essai de traction longitudinale à TA, Eproyvette a section complete

Pos.	Proben-Nr.	Schmelzen-Nr.	Probenabmessung	Streckgrenze	Zugfestigkeit	Dehnung
Item	Specimen No.	Heat No.	Specimen dimensions	Yield strength	Tensile strength	Elongation
Poste	No. de l'éprouv.	No. de coulée	Dimensions de l'éprouv.	Limite élastique	Résistance à la traction	Allongement
Anforderungen			mm	Rp 0,2 %	Rm	A2"
Requirements				KSI	KSI	%
Exigences				MIN 75	MIN 95	MIN 12.00
0008	000001	253636	12,74 X 2,13	103	125	19,00
0008	000002	253636	12,74 X 2,13	101	124	19,00
0008	000003	253636	12,74 X 2,13	101	125	18,00

Randentkohlung / Surface decarburization / Décarburation superficielle

Pos. / Item / Poste: 0008

acc. to AMS-6360, partial decarburization outside max. 0.014 in, partial decarburization inside max. 0.014 in, partial decarburization outside and inside max. 0.018 in, partial decarburization outside and inside max. 0.457 mm, without total decarburization; partial decarb. out. max.: 0.356 mm; partial decarb. ins. max.: 0.356 mm

Vermerk / Remark / Remarque

Pos. / Item / Poste: 0008

Certificate remarks: The steel grade corresponds to MIL-T-6736B, AMS 6360M, material free from mercury contamination, FAR BAA: 52.225-1 CANNOT COMPLY, DFARS BAA: 252.225-7001 CAN COMPLY, FAR TAA: 52.225-5 CAN COMPLY, No weld repair has been carried out, Country of origin of the material and heat: Germany, Aircraft quality steel acc. to AMS 2301K; see appendix page 1 of 1.

Pos. / Item / Poste: 0008

Macroscopic examination: acc. to ASTM-E 381

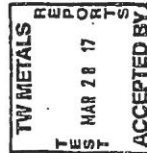
Pos. / Item / Poste: 0008

Magnetic particle inspection: acc. to AMS 2301K/ASTM-E 1444, on prematerial

Pos. / Item / Poste: 0008

Grain size: acc. to ASTM-E 112; Grain size and finer: 5; Grain size: Longitudinal structure microscopy, On prematerial

Verkäufer(in) / Sales Personnel / Personne chargée : Mr Schwarz, Tel.: 05254 81-204311, Fax: 204391



413

Banteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666

**BENTELER**  
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.:  
Document No.:  
No. du document:

41 091327/001/P

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

Blatt: 4 /  
Page: 4



Paderborn Schloß Neuhaus, 07.03.2017, TEL.: 05254.81-201768 FAX: 05254.81-201752

Abnahmebeauftragter  
Inspection representative

Contrôleur

i. A. THOMAS GOLLAN / Tat

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.  
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.  
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.

*[Handwritten signature]*



Benteler Steel/Tube GmbH  
Residenzstraße 1  
33104 Paderborn  
Germany  
Tel.: 49.5254.81-0 Fax: 49.5254.13666

**BENTELER**

Steel/Tube

Blatt: von  
Page: 1 of 1  
Page: de

Dokument-Nr.  
Document No.:  
No. de document:

41-991327/001/P

Abnahmeprüfzeugnis EN 10204-3.1 / Anhang  
Inspection Certificate EN 10204.3.1 / appendix  
Certificat de réception EN 10204-3.1 / appendice

Halbzeuguntersuchung: Stahlsorte 4130 / Semi finished product examination: grade 4130 / Produit semi-fini: nuance 4130

Schmelzen-Nr. Heat No. Coulée No.	Position Item Poste	Korngröße Grain size Grosseur de grain (ASTM-E 112)	Härtebarkeit (min. Anforderungen) Hardenability (min. requirements) Trempeabilité (exigence min.) (ASTM-A 255)		Magnetpulverprüfung Magnetic particle inspection Essai à la poudre magnétique (AMS 2301 K/ASTM- 1444)		Makroätzung Macrostructure test Essai de macrostructure (ASTM-E 381)		
			J(5/16") min. 35 HRC	J(8/16") min. 28 HRC	F max. 0,34	S max. 0,25	max. S 2	max. R 1	max. C 2
253636	008	9	44	34	0,020	0,015	S 2	R 1	C 2
Decarburization Depth		Outside 0,000 mm Inside 0,050 mm							

TW METALS  
TEST REPORTS  
MAR 28 17  
ACCEPTED BY



Der Stahl ist frei von Quecksilberverunreinigungen. / The steel is free of mercury contamination. / L'acier est libre des contaminations de mercure.

Paderborn Schloß Neuhaus, 07.03.2017  
Tel.: (0)5254.81-201760 Fax: (0)5254.81-201752

Abnahmebeauftragter  
Inspection representative  
Contrôleur

Thomas Gollan

15





O'Neal High-Performance Metals Group



**Packing  
Slip**

ORDER NO.: 60631158

FROM: CFAN

PAGE 2

CUST NUMBER: 1203820 NET WGT:

7.392 REQ.DATE: 05/09/17 CONFIRMED

SOLD TO:  
DART AEROSPACE LTD  
1270 ABERDEEN ST  
HAWKESBURY ON  
CANADA

SHIP TO:  
DART AEROSPACE LTD  
1270 ABERDEEN ST  
HAWKESBURY ON  
ONTARIO CANADA

CN K6A 1K7

CN K6A 1K7

SALESPERSON: DONNA SMALLEY  
TERMS: NET 30 DAYS  
F.O.B.: SHIPPING POINT  
CUST ORD NO.: PO36183 ADD  
VIA: COMMON CARRIER  
FREIGHT: PREPAID  
RELEASE NO.:  
RECEIVING PHONE:

SHIP BY: 05/04/17  
27 ENGLEHARD DRIVE  
MONROE TWP NJ 08831

"TW Metals MSDS data is available on our web site at [www.twmetals.com](http://www.twmetals.com). MSDS data can be found under the Technical Resources Tab, Product Statistics & Data and the TW Metals MSDS's heading. If you do not have web site access you may telephone 610-458-1300 and we will mail or fax a copy of our current MSDS data to your location."

**"CERTIFICATE OF CONFORMANCE"**

"TW Metals certifies that the material supplied on this purchase order and contained in the heat/lot number referenced above has been manufactured, inspected, and tested in accordance with the material specification. These records are on file at TW Metals. Packaging material for shipments to Europe and China consists of manufactured wood products and complies with the European emergency measures for coniferous non-manufactured wood packing material"

Authorized Test Report Clerk Cgm Harnish

Date: 5/04/17

These commodities have been exported from the United States in accordance with the U.S. export control laws, export administrations regulations. Diversion contrary to U.S. law prohibited.

**THANK YOU FOR THIS ORDER**

TERMS AND CONDITIONS APPLICABLE TO THE SALE OF THESE  
PRODUCTS ARE SET FORTH ON OUR WEBSITE FOR YOUR CAREFUL  
REVIEW.  
<http://www.twmetals.com/invoice-terms.html>

PUFA™

Producer of Premium Stainless Steel Seamless Tubes

# MILL TEST REPORT

Purchaser.: TW METALS-Cranbury				Certificate No.: 15-5-23					
Contract No.: TWM P.O.No.: M49329273				Date of Issue.: 2015.5.7					
Commodity: Stainless Steel Seamless Tubes		Specifications: ASTM A213-14/ASME SA213-13/ASTM A269-14 EAW							
Process: Cold Drawn				Delivery Condition: OD Polished to 240 Grit					
Steel Grade	Heat Number	Lot Number	Dimensions		Quantity				
					Pieces	Feet			
TP304/TP304L	YX1410-664	4-34	3/8" x 0.065" x 20'		250	5,000			
Chemical Composition by Weight (%)									
Element	C	Mn	P	S	Si	Cr	Ni	Mo	Co
Requirements	≤0.035	≤2.00	≤0.045	≤0.030	≤1.00	18.00-20.00	8.00-12.00	-	-
Ladle Analysis	0.010	0.63	0.028	0.001	0.46	18.33	8.05	-	-
Product Analysis	0.019	0.79	0.033	0.001	0.51	18.52	8.50	-	-
Mechanical Properties									
Test Item	Elongation (% in 2")		Tensile Strength (PSI) Rm			Yield Strength (PSI) Rp / 0.2%			
Requirements	≥35		≥75,000			≥30,000			
Test Results	63/64		92,000/93,000			36,000/37,000			
Test Item	Reduction of Area Z (%)	Hardness	Cold Bend Test	Flaring Test	Flattening Test	Flange Test	P.M.I. Test		
Requirements	-	HRB≤80	-	30%	e=0.09	-	-		
Test Results	-	77/79	-	Passed	Passed	-	OK		
Test Item	Eddy Current Test	Air Underwater Pressure Test	Ultrasonic Test	Intergranular Corrosion Test	Macroscopic Inspection				
Requirements	ASTM E 426	-	-	ASTM A262 E	End Cut	Appearance			
Test Results	Passed	-	-	OK	OK	OK			

ISO 9001:2008 Certified by Intertek 110703068

PED Certified by SZUTEST 2195-PED-1221604

## Additional Remarks:

- (1) All tubes annealed to above 1900 Deg F and water quenched below 800 Deg F in 3 minutes
- (2) All tubes tested per ASTM A1016-14
- (3) Materials is NACE MR0103-2007 compliant (per Section 2.5)
- (4) Materials is NACE MR0175/ISO 15156-2003 compliant (per Section 4.2.1)
- (5) In Compliance with EN 10204-3.1
- (6) In Compliance with RoHS Stipulation
- (7) No weld repair performed
- (8) Free from mercury contamination
- (9) Free from radioactive contamination
- (10) Billets melt and pipes/tubes manufactured in China
- (11) All tubes 100% PMI tested
- (12) All tubes 100% Eddy Current tested

**CANNOT CERTIFY COMPLIANCE  
FAR BAA / DFARS BAA / FAR TAA**



By:

*James Shi*

James Shi / Manager

Quality Control Department

We hereby certify that this report is true and correct.

**Shanghai Pufa Stainless Steel Pipe Factory**  
No. 59, Shuangye Road, Wanggang, New Pudong District, Shanghai, China

TEST	TW METALS		REPORTS
	JUN 17 2015		
	ACCEPTABLE BY		

PUFA™

Producer of Premium Stainless Steel Seamless Tubes

# MILL TEST REPORT

Purchaser.: TW METALS-Cranbury				Certificate No.: 16-1-13					
Contract No.: TWM P.O.No.: M49342471				Date of Issue.: 2016.1.5					
Commodity: Stainless Steel Seamless Tubes				Specifications: ASTM A213-15c/ASME SA213-15/ASTM A269-15a EAW					
Process: Cold Drawn				Delivery Condition: OD Polished to 240-Grit					
Steel Grade	Heat Number	Lot Number	Dimensions				Quantity		
							Pieces	Feet	
TP304/TP304L	YX1501-783	11-63	3/4" x 0.049" x 20'				250	5,000	
Chemical Composition by Weight (%)									
Element	C	Mn	P	S	Si	Cr	Ni	Mo	Co
Requirements	≤0.035	≤2.00	≤0.045	≤0.030	≤1.00	18.00-20.00	8.00-12.00	-	-
Ladle Analysis	0.012	0.68	0.031	0.001	0.37	18.35	8.05	-	-
Product Analysis	0.019	0.70	0.033	0.002	0.39	18.37	8.31	-	-
Mechanical Properties									
Test Item	Elongation (% in 2")		Tensile Strength (PSI) Rm			Yield Strength (PSI) Rp / 0.2%			
Requirements	≥35		≥75,000			≥30,000			
Test Results	65/66		89,000/90,000			34,000/35,000			
Test Item	Reduction of Area Z (%)	Hardness	Cold Bend Test	Flaring Test	Flattening Test	Flange Test	P.M.I. Test		
Requirements	-	HRB≤80	-	22%	e=0.09	-	-		
Test Results	-	75/77	-	Passed	Passed	-	OK		
Test Item	Eddy Current Test	Air Underwater Pressure Test	Ultrasonic Test	Intergranular Corrosion Test	Macroscopic Inspection				
Requirements	ASTM E 426	-	-	ASTM A262 E	End Cut	Appearance			
Test Results	Passed	-	-	OK	OK	OK			

ISO 9001:2008 Certified by Intertek 110703068

PED Certified by SZUTEST 2195-PED-1526002

## Additional Remarks:

- (1) All tubes annealed to above 1900 Deg F and water quenched below 800 Deg F in 3 minutes
- (2) All tubes tested per ASTM A1016-14
- (3) Materials is NACE MR0103-2007 compliant (per Section 2.5)
- (4) Materials is NACE MR0175/ISO 15156-2003 compliant (per Section 4.2.1)
- (5) In Compliance with EN 10204-3.1
- (6) In Compliance with RoHS Stipulation
- (7) No weld repair performed
- (8) Free from mercury contamination
- (9) Free from radioactive contamination
- (10) Billets melt and pipes/tubes manufactured in China
- (11) All tubes 100% PMI tested
- (12) All tubes 100% Eddy Current tested

**CANNOT CERTIFY COMPLIANCE  
FAR BAA / DFARS BAA / FAR TAA**



By:

*James Shi*

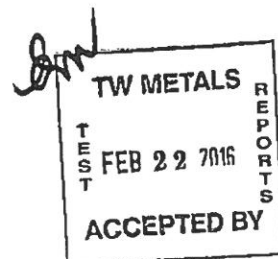
James Shi / Manager

Quality Control Department

We hereby certify that this report is true and correct.

**Shanghai Pufa Stainless Steel Pipe Factory**

No. 59, Shuangye Road, Wanggang, New Pudong District, Shanghai, China



Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49 5254.81-0 Fax: +49.5254.13666

# BENTELER

Steel/Tube

## ABNAHMEPRÜFZEUGNIS EN 10204-3.1 INSPECTION CERTIFICATE EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1 EN 10204:2005-01

Benteler Steel/Tube GmbH - Postfach 1340 - 33043 Paderborn - Deutschland

TW Metals  
The Aboretum, Suite 204  
760 Constitution Drive  
EXTON PA 19341  
USA

Dokument-Nr.: 41-991327/001/P  
Document No.:  
No. du document:

Kunden-Bestell-Nr.:  
Purchase Order No.:  
No. de commande du client:

Benteler Auftrags-Nr.:  
Benteler Order No.:  
No. de commande Benteler:

Versandanzeigen-Nr.:  
Dispatch Note No.:  
No. d'avis d'expédition:

Produkt: NAHTLOSE STAHLROHRE  
Product: SEAMLESS STEEL TUBES  
Produit: TUBES D'ACIER SANS SOUDURE

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

46004784TW M49362520

Hersteller:  
Manufacturer:  
Producteur:

Herstellerzeichen:  
Manufacturer's brand:

Marque du producteur:

Stempel des Abnahmebeauftragten: WA  
Stamp of the inspection representative:

Poinçon du contrôleur:

Stahlschmelzungsverfahren: ELEKTROSTAHL  
Steelmaking process: ELECTRIC FURNACE  
Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

Lieferbedingungen: AMS-T-6736B-08 Type 1, ASTM-A 519-2006, MIL-T-6736B Type 1, AMS6360 Rev. M, AMS 2301K

Terms of delivery:

Conditions de livraison:

Maße - Toleranzen:

Dimensions-tolerances:

Dimensions-tolérances:

Stahlsorte:

Steel grade:

Nuance d'acier:

Lieferzustand:

Delivery condition:

État de livraison:

Produktkennzeichnung:

Product marking:

Marquage du produit:

FSD: BENTELER AMS6360M-AMS-T-6736 B 1-MIL-T-6736 B 1-AMS 2301K 4130 Condition N HEAT-NO.  
CD AQ S DIMENSIONS WA GERMANY

AZ = Anzeichenzeichnung, Etching ink marking, Gravure à l'encre . FK = Farbschablonierung, color marking, marquage par couleur . FS = Farbschablonierung, paint stencilling, marquage par peinture . FSD = Farbschablonierung, color jet printer, imprimante à jet d'encre de couleur . LX = Laserkennzeichnung, Laser marking, Marquage laser . PK = Etikettenkennzeichnung, tag marking, marquage sur étiquette . PS = Prägestempel, die stamp, marquage par poinçonnage . FS = Tintenstrahlkennzeichnung, ink jet spray marking, imprimante à jet d'encre .



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Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49-5254.81-0 Fax: +49-5254.13666

**BENTELER**

Steel/Tube

**ABNAHMEPRÜFZEUGNIS EN 10204-3.1**

INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 41-991327/001/P  
Document No.:  
No. du document:

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

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Page:  
Page:

Pos.	Stück	Maße	Gesamtlänge	Gewicht	Schmelzen-Nr.	Prüfdruck	Rohr-Nr.-Gruppe	Vielfachlängen
Item	Number	Dimensions	Length total	Weight	Heat No.	Test pressure	Tube number group	Multiple lengths
Poste	Nombre	Dimensions	Longueur totale	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multiples
		feet	feet	lbs				
0008	125	0.500" O.D. * 0.083" WT	2500,56	926	253636			
9		20 FT - 24 FT						

**Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]**

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU
Item	Heat No.									
Poste	No. de coulée									
0008	253636	0,320	0,270	0,57	0,008	0,001	0,88	0,17	0,09	0,14

**Produktanalyse [%] / Product analysis [%] / Analyse sur produit [%]**

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU
Item	Heat No.									
Poste	No. de coulée									
0008	253636	0,310	0,280	0,55	0,012	0,002	0,88	0,17	0,09	0,15

**Prüfergebnisse / Test results / Résultats des essais**

Die Rohre wurden zerstörungsfrei geprüft: The tubes are non destructive tested: Les tubes ont passé un essai non destructif:	ET-test: acc. to ASTM-A 450; ET - Test method: acc. to ASTM-E 309; for imperfections; ET-test: ET with rotating pancake coils; according to EN 10246-3; imperfections; Notch depth: 0,30 mm; notch width < = notch depth; notch length min. 2 x transducer width (max. 50 mm)	PASSED
--	---	--------

Augensichtkontrolle: Visual inspection: Examen visuel:	Materialeverwechslungsprüfung: Material conformity test: Vérification de la nuance:	PASSED	Maßkontrolle: Dimensions examination: Vérification des dimensions:	PASSED
--	---	--------	--	--------

**Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques**

Die Probenahme erfolgte an Vielfachlängen.  
The sampling was carried out on multiple lengths.  
L'échantillonnage était réalisé aux longueurs multiples.



Handwritten mark

Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49 5254 81-0 Fax: +49 5254 13666

**BENTELER**  
Steel/Tube

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Page:

# ABNAHMEPRÜFZEUGNIS EN 10204-3.1

INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 41-991327/001/P

Document No.:  
No. du document:

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

Zugversuch längs bei RT, Vollprobe / Tensile test longitudinal at RT, Full section test specimen / Essai de traction longitudinale à TA, Eproyvette a section complete

Pos.	Proben-Nr.	Schmelzen-Nr.	Probenabmessung	Streckgrenze	Zugfestigkeit	Dehnung
Item	Specimen No.	Heat No.	Specimen dimensions	Yield strength	Tensile strength	Elongation
Poste	No. de l'éprouv.	No. de coulée	Dimensions de l'éprouv.	Limite élastique	Résistance à la traction	Allongement
Anforderungen			mm	Rp 0,2 %	Rm	A2"
Requirements				KSI	KSI	%
Exigences				MIN 75	MIN 95	MIN 12.00
0008	000001	253636	12,74 X 2,13	103	125	19,00
0008	000002	253636	12,74 X 2,13	101	124	19,00
0008	000003	253636	12,74 X 2,13	101	125	18,00
						1. Formel
						1. Formula
						1. Formule

## Randentkohlung / Surface decarburization / Décarburation superficielle

Pos. / Item / Poste: 0008

acc. to AMS-6360, partial decarburization outside max. 0.014 in, partial decarburization inside max. 0.014 in, partial decarburization outside and inside max. 0.018 in, partial decarburization outside and inside max. 0.457 mm, without total decarburization; partial decarb. out. max.: 0.356 mm; partial decarb. ins. max.: 0.356 mm

## Vermerk / Remark / Remarque

Pos. / Item / Poste: 0008

Certificate remarks: The steel grade corresponds to MIL-T-6736B, AMS 6360M, material free from mercury contamination, FAR BAA: 52.225-1 CANNOT COMPLY, DFARS BAA: 252.225-7001 CAN COMPLY, FAR TAA: 52.225-5 CAN COMPLY, No weld repair has been carried out, Country of origin of the material and heat: Germany, Aircraft quality steel acc. to AMS 2301K; see appendix page 1 of 1.

Pos. / Item / Poste: 0008

Macroscopic examination: acc. to ASTM-E 381

Pos. / Item / Poste: 0008

Magnetic particle inspec.: acc. to AMS 2301K/ASTM-E 1444, on prematerial

Pos. / Item / Poste: 0008

Grain size: acc. to ASTM-E 112; Grain size and finer: 5; Grain size: Longitudinal structure micrography, On prematerial

Verkäufer(in) / Sales Personnel / Personne chargée : Mr Schwarz, Tel.: 05254 81-204311, Fax: 204391



Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666

**BENTELER**   
Steel/Tube

**ABNAHMEPRÜFZEUGNIS EN 10204-3.1**

INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

41-991327/001/P

Dokument-Nr.:  
Document No.:  
No. du document:

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

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Paderborn Schloß Neuhaus, 07.03.2017, TEL.: 05254.81-201768 FAX: 05254.81-201752

Abnahmebeauftragter  
Inspection representative

Contrôleur

i. A. THOMAS GOLLAN / Tat

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.  
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.  
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.





Benteler Steel/Tube GmbH  
Residenzstraße 1  
33104 Paderborn  
Germany  
Tel.: 49.5254.81-0 Fax: 49.5254.13666



Abnahmeprüfzeugnis EN 10204-3.1 / Anhang  
**Inspection Certificate EN 10204.3.1 / appendix**  
Certificat de réception EN 10204-3.1 / appendice

Dokument-Nr.  
**Document No.:**  
No. de document:

41-991327/001/P

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**Page:** 1 of 1  
Page: de

Halbzeuguntersuchung: Stahlsorte 4130 / Semi finished product examination: grade 4130 / Produit semi-fini: nuance 4130

Schmelzen-Nr. Heat No. Coulée No.	Position Item Poste	Korngröße Grain size Grossueur de grain (ASTM-E 112)	Härbarkeit (min. Anforderungen) Hardenability (min. requirements) Trempeabilité (exigence min.) (ASTM-A 255)		Magnetpulverprüfung Magnetic particle inspection Essai à la poudre magnétique (AMS 2301 K/ASTM- 1444)	Makroätzung Macrostructure test Essai de macrostructure (ASTM-E 381)		
			J(5/16") min. 35 HRC	J(8/16") min. 28 HRC		max. S 2	max. R 1	max. C 2
253636 Decarburization Depth	008	min. 5	44	34	0,020	S 2	R 1	C 2
		Outside 0,000 mm	Inside 0,050 mm					



Der Stahl ist frei von Quecksilberverunreinigungen. / The steel is free of mercury contamination. / L'acier est libre des contaminations de mercure.

Paderborn Schloß Neuhaus, 07.03.2017  
Tel.: (0)5254.81-201760 Fax: (0)5254.81-201752

Abnahmebeauftragter  
**Inspection representative**  
Contrôleur

Thomas Gollan

116



Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666

# BENTELER

## Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1  
EN 10204:2005-01

Benteler Steel/Tube GmbH - Postfach 1340 - 33043 Paderborn - Deutschland

TW Metals  
The Aboretum, Suite 204  
760 Constitution Drive  
EXTON PA 19341  
USA

41-969259/001/P

Dokument-Nr.:  
Document No.:

Kunden-Bestell-Nr.:  
Purchase Order No.:  
No. de commande du client:

Benteler Auftrags-Nr.:  
Benteler Order No.:  
No. de commande Benteler:

Versandanzeigen-Nr.:  
Dispatch Note No.:  
No. d'avis d'expédition:

Produkt: NAHTLOSE STAHLROHRE  
Product: SEAMLESS STEEL TUBES  
Produit: TUBES D'ACIER SANS SOUDURE

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

46004514 TW M49355846

1627804

4174963

Blatt: 1 / 4  
Page: 1 / 4

Hersteller:  
Manufacture:  
Producteur:  
Herstellerzeichen:  
Manufacturer's brand:  
Marque du producteur:



Stempel des Abnahmebeauftragten:  
Stamp of the inspection representative:  
Poinçon du contrôleur:

Stahlschmelzungsverfahren:  
STEELMAKING PROCESS:  
Procédé d'élaboration de l'acier:

AMS-T-6736B Type 1, ASTM-A 519-2006, MIL-T-6736B Type 1, AMS6360 Rev. M, AMS 2301K

Lieferbedingungen:

Terms of delivery:

Conditions de livraison:

Maße - Toleranzen:

Dimensions-tolerances:

Dimensions-tolérances:

Stahlsorte:

Steel grade:

Nuance d'acier:

Lieferzustand:

Delivery condition:

État de livraison:

Produktkennzeichnung:

Product marking:

Marquage du produit:

AEZ = Ätzenbeschriftung, Etching ink marking, Gravure à l'encre . FK = Farbbeschriftung, color marking, marquage par couleur . FS = Farbschablonierung, point stencilling, marquage par peinture . FSD = Farbstrahldrucker, Color jet printer, imprimante à jet d'encre de couleur . LX = Laserbeschriftung, Laser marking, Marquage laser . PKE = Etikettenkennzeichnung, tag marking, marquage sur étiquette . PS = Prägestempel, die stamp, marquage par poinçonnage . TS = Tutenstahlkennzeichnung, ink jet spray marking, imprimante à jet d'encre .



FSD: BENTELER AMS6360M-AMS-T-6736 B 1-MIL-T-6736 B 1-AMS 2301K 4130 Condition N HEAT-NO.

CD AQ S DIMENSIONS WA GERMANY

**ABNAHMEPRÜFZEUGNIS EN 10204-3.1**  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 41-969259/001/P  
Document No.:  
No. du document:

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

Pos.	Stück	Maße	Gesamtlänge	Gewicht	Schmelzen-Nr.	Prüfdruck	Rohr-Nr.-Gruppe	Vielfachlängen
Item	Number	Dimensions	Length total	Weight	Heat No.	Test pressure	Tube number group	Multiple lengths
Poste	Nombre	Dimensions	Longueur totale	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multiples
			feet	lbs				
0004	181	0.750" O.D. * 0.049" WT 20 FT - 24 FT	4334,97	1565	251554			

**Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]**

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU
Item	Heat No.									
Poste	No. de coulée									
0004	251554	0,310	0,250	0,53	0,009	0,002	0,88	0,19	0,10	0,13

DAS  
9  
9-89

**Produktanalyse [%] / Product analysis [%] / Analyse sur produit [%]**

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU
Item	Heat No.									
Poste	No. de coulée									
0004	251554	0,310	0,250	0,54	0,012	0,002	0,89	0,19	0,11	0,14

TW METALS  
T E P  
E DEC 16 2016  
S R T  
ACCEPTED BY

**Prüfergebnisse / Test results / Résultats des essais**

Die Rohre wurden zerstörungsfrei geprüft: The tubes are non destructive tested: Les tubes ont passé un essai non destructif:	ET-test: acc. to ASTM-A 450; ET - Test method: acc. to ASTM-E 309; for imperfections; ET-test: ET with rotating pancake coils; according to EN 10246-3; imperfections; Notch depth: 0.30 mm; notch width < = notch depth; notch length min. 2 x transducer width (max. 50 mm)	PASSED
--	---	--------

Augensichtkontrolle: Visual inspection: Examen visuel:	PASSED	Materialverwechslungsprüfung: Material conformity test: Vérification de la nuance:	PASSED	Maßkontrolle: Dimensions examination: Vérification des dimensions:	PASSED
--	--------	--	--------	--	--------

**Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques**

Die Probenahme erfolgte an Vielfachlängen.  
The sampling was carried out on multiple lengths.  
L'échantillonnage était réalisé aux longueurs multiples.

Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666



Steel/Tube

# ABNAHMEPRÜFZEUGNIS EN 10204-3.1

INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 41-969259/001/P

Document No.:  
No. du document:

Prüf-Nr.:  
Inspection No.:

No. du certificat:

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Page:

Zugversuch längs bei RT, Vollprobe / Tensile test longitudinal at RT, Full section test specimen / Essai de traction longitudinale à TA, Eprouvette a section complete

Pos.	Proben-Nr.	Schmelz-Nr.	Probenabmessung	Streckgrenze	Zugfestigkeit	Dehnung
Item	Specimen No.	Heat No.	Specimen dimensions	Yield strength	Tensile strength	Elongation
Poste	No. de l'éprouv.	No. de coulée	Dimensions de l'éprouv.	Limite élastique	Résistance à la traction	Allongement
Anforderungen			mm	Rp 0,2 %	Rm	A2"
Requirements				KSI	KSI	%
Exigences				MIN 75	MIN 95	MIN 12.00
0004	000001	251554	19,03 X 1,23	125	134	16,00
0004	000002	251554	19,03 X 1,23	123	133	17,00
0004	000003	251554	19,03 X 1,23	123	133	18,00
0004	000004	251554	19,03 X 1,23	124	133	17,00
0004	000005	251554	19,03 X 1,23	124	134	17,00

Randentkohlung / Surface decarburization / Décarburation superficielle

Pos. / Item / Poste: 0004

acc. to AMS-6360, partial decarburization outside max. 0.009 in, partial decarburization inside max. 0.009 in, partial decarburization outside and inside max. 0.012 in, partial decarburization outside and inside max. 0.305 mm, without total decarburization; partial decarb. out. max.: 0,229 mm; partial decarb. ins. max.: 0,229 mm

Vermerk / Remark / Remarque

Pos. / Item / Poste: 0004

Certificate remarks: The steel grade corresponds to MIL-T-6736B, AMS 6360M, material free from mercury contamination, FAR BAA: 52.225-1 CANNOT COMPLY, DFARS BAA: 252.225-7001 CAN COMPLY, FAR TAA: 52.225-5 CAN COMPLY, No weld repair has been carried out, Country of origin of the material and heat: Germany, Aircraft quality steel acc. to AMS 2301K; see appendix page 1 of 1

Pos. / Item / Poste: 0004

Macroscopic examination: acc. to ASTM-E 381

Pos. / Item / Poste: 0004

Magnetic particle inspection: acc. to AMS 2301K/ASTM-E 1444, on prematerial

Pos. / Item / Poste: 0004

Grain size: acc. to ASTM-E 112; Grain size and finer: 5; Grain size: Longitudinal structure microscopy, On prematerial

Verkäufer(in) / Sales Personnel / Personne chargée : Mr Schwarz, Tel.: 05254 81-204311, Fax: 204391

Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666



Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

41-969259/001/P

Dokument-Nr.:  
Document No.:  
No. du document:

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

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Page: 4 / 4  
Page: 4 / 4

Paderborn Schloß Neuhaus, 28.10.2016, TEL.: 05254.81-201767 FAX: 05254.81-201752

Abnahmebeauftragter  
Inspection representative

Contrôleur

i.A. THOMAS GOLLAN / TEM

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.  
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.  
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.

Benteler Steel/Tube GmbH  
Residenzstraße 1  
33104 Paderborn  
Germany  
Tel.: 49.5254.81-0 Fax 49.5254.13666



Abnahmeprüfzeugnis EN 10204-3.1 / Anhang  
**Inspection Certificate EN 10204.3.1 / appendix**  
Certificat de réception EN 10204-3.1 / appendice

Dokument-Nr.  
**Document No.:**  
No. de document

41-969259/001/P

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**Page:** 1 of 1  
Page: de

Halbzeuguntersuchung: Stahlsorte 4130 / Semi finished product examination: **grade 4130** / Produit semi-fini: nuance 4130

Schmelzen-Nr. Heat No. Coulée No.	Position Item Poste	Korngröße Grain size Grosseur de grain (ASTM-E 112)	Härtebarkeit (min. Anforderungen) Hardenability (min. requirements) Trepabilité (exigence min.) (ASTM-A 255)		Magnetpulverprüfung Magnetic particle inspection Essai à la poudre magnétique (AMS 2301K / ASTM-E 1444)	Makroätzung Macrostructure test Essai de macrostructure (ASTM-E 381)
			J(5/16") min. 35 HRC	J(8/16") min. 28 HRC		
251554	004	min. 5	41	32	F max. 0,34	max. S 2
Decarburization Depth		9	Inside 0,000 mm		S max. 0,25	max. R 1
		Outside 0,010 mm			0,020	S 2
					0,024	R 1
						max. C 2

Der Stahl ist frei von Quecksilberverunreinigungen. / The steel is free of mercury contamination. / L'acier est libre des contaminations de mercure.

Paderborn Schloß Neuhaus, 28.10.2016  
Tel.: (0)5254.81-201760 Fax: (0)5254.81-201752

Abnahmebeauftragter  
**Inspection representative**  
Contrôleur

Thomas Gollan



PRECISION TUBE CO.  
287 WISSAHICKON AVE.  
NORTH WALES PA 19454

Control No: 2839

**CERTIFIED TEST REPORT**

CUSTOMER PURCHASE ORDER NO.	CUST. ORD. NO.	PRECISION TUBE P/N
M 49361230 LINE 001	438268	24A037500580006

**SOLD:** TW METALS  
**TO** 235 TUBEWAY  
CAROL STREAM, IL 60188  
UNITED STATES

**SHIP:** TW METALS  
**TO** 235 TUBEWAY  
CAROL STREAM, IL 60188  
UNITED STATES

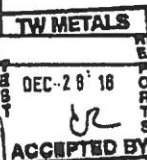
QUANTITY ORD.	DESCRIPTION	QTY. SHIPPED	DATE SHIPPED
4008 FT DAS 9 9-89	METAL - 6061 ALUM TEMPER - T6 SPEC - AMS 4082P AMS-WW-T-700/6C ASTM-B-210-12 LENGTH - 12 FT LGTH TOL +.1250 IN -.0000 IN SHAPE - ROUND FINISH - STRAIGHT EXACT LENGTHS OD .3750 +.0030 -.0030 ID WALL .0580 +.0040 -.0040	4188 FT	12/21/16

**MECHANICAL PROPERTIES**

SAMPLE #	TENSILE STRENGTH (P.S.I.)	YIELD STRENGTH (P.S.I.)	ELONGATION IN 2 INCHES (%)	ROCKWELL HARDNESS	AVERAGE GRAIN SIZE (MM.)
1	44,103	37,550	20		

**DESTRUCTIVE TESTS**

Comments: FAR BAA COMPLIES, DFARS BAA COMPLIES, FAR TAA COMPLIES



**NON-DESTRUCTIVE TESTS**

EDDY CURRENT: PASS

**CHEMICAL COMPOSITION**

ALLOY: 6061	HEAT:	TRACEABILITY #: 1180968							
		RAW MATL VENDOR: PTC7874 - Kaiser Aluminum							
	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Al
Min	0.40		0.15		0.80	0.04			Rem.
Max	0.80	0.70	0.40	0.15	1.20	0.35	0.25	0.15	
OTHER ELEMENTS: 0.05 MAX EACH / 0.15 MAX TOTAL									

We hereby certify that the material has been manufactured and tested in accordance with the requirements of the applicable specifications and descriptions set forth on Precision Tube's sales acknowledgement. During the manufacturing, testing and inspection, the product did not come into direct contact with mercury or any of its compounds, nor with any mercury containing device employing a single boundry containment. Test results indicate that the material is compliant with the current revision of the RoHS Directive (2011/65/EU).

Melted and Manufactured in USA  
QMS Registered to ISO 9001: 2008

By:   
Art Onaitis  
QA Manager

12/21/16

Page: 1 of 1

C

# KAISER ALUMINUM FABRICATED PRODUCTS

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
2425 STEVENS DRIVE  
RICHLAND, WA 99352

## CERTIFIED TEST REPORT

<http://Online.KaiserAluminum.com>



CUSTOMER PO NUMBER: <b>PTC7874</b>		CUSTOMER PART NUMBER: <b>SPIRIT-371850</b>		PRODUCT DESCRIPTION: <b>5.400 LB/PC .500 LB/-0 LB 1.312 OD X .085 WALL ESRT</b>	
KAISER ORDER NUMBER: <b>320897</b>	LINE ITEM: <b>001</b>	SHIP DATE: <b>10/28/2016</b>	KAISER LOT NUMBER: <b>50751-347</b>	ALLOY: <b>6061</b>	TEMPER: <b>O</b>
WEIGHT SHIPPED: <b>10769.000 LB</b>	QUANTITY: <b>1950.000 PCS</b>	B/L NUMBER: <b>005171</b>	DIAM/DAF/THKNS:	WIDTH:	LENGTH: <b>13.984 FT</b>
SHIP TO:  <b>PRECISION TUBE CO 287 WISSAHICKON AVENUE N. WALES, PA 19454 USA</b>			SOLD TO:  <b>MUELLER INDUSTRIES, INC PRECISION TUBE 8285 TOURNAMENT DRIVE STE. 150 MEMPHIS, TN 38125 USA</b>		

### Actual Physical Properties

REFERENCE	DASH#	SAMPLE#	UTS (KSI)	YTS (KSI)	%Elong in 2	HARDNESS	CONDUCT.	BEND
50751-347	0001	0001	18.7	5.9	27.2	NA N/A	N/A	N/A
50751-347	0001	0002	18.4	5.5	27.8	N/A	N/A	N/A
50751-347	0001	0003	18.3	5.6	27.1	N/A	N/A	N/A
50751-347	0001	0004	18.0	5.5	26.7	N/A	N/A	N/A
50751-347	0001	0005	18.3	5.9	27.2	N/A	N/A	N/A
50751-347	0001	0006	17.7	5.6	27.6	N/A	N/A	N/A
50751-347	0001	0007	18.3	5.9	26.8	N/A	N/A	N/A
50751-347	0001	0008	18.6	5.7	25.7	N/A	N/A	N/A
50751-347	0001	0009	18.2	5.5	26.5	N/A	N/A	N/A
50751-347	0001	0010	18.6	5.8	26.0	N/A	N/A	N/A
50751-347	0001	0011	18.5	5.7	28.6	N/A	N/A	N/A

### Chemical Composition (wt%), Aluminum Remainder

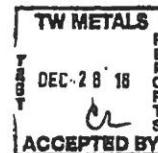
LIMITS	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Bi	Zr	Ea	Tot
Maximum	0.80	0.70	0.40	0.15	1.20	0.35	0.25	0.15	NA	NA	NA	0.05	.15
Minimum	0.40	0.00	0.15	0.00	0.80	0.04	0.00	0.00	NA	NA	NA	0.00	.0
F76091	.58	.30	.22	.06	1.03	.09	.08	.03	.00	.00	.00	.01	.02
F76216	.60	.30	.21	.05	1.01	.09	.07	.03	.00	.00	.00	.01	.02

### Applicable Requirements:

ASTM-B241-16 NON-STENCILED ASTM-B221-14 ASTM-B345-11 AMS-QQ-A-200/9A TYPE I  
UNS#A96061 Also conforms to EN 10204 3.1

### Miscellaneous Notes

MANUFACTURED IN USA MELTED IN USA  
MERCURY IS NOT A NORMAL BACKGROUND ELEMENT IN ALUMINUM ALLOYS. NEITHER MERCURY NOR ANY  
OF ITS COMPOUNDS ARE UTILITZED BY KAISER ALUMINUM IN THE MANUFACTURE OF THIS MATERIAL.



Plant Serial: 00013006  
Kaiser Order Number: 320897  
Line Item: 001

C

# **KAISER**

## **ALUMINUM**

### **FABRICATED PRODUCTS**

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
2425 STEVENS DRIVE  
RICHLAND, WA 99352

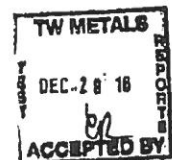
## **CERTIFIED TEST REPORT**

<http://Online.KaiserAluminum.com>

### **CERTIFICATION**

Kaiser Aluminum Fabricated Products, LLC hereby certifies that metal shipped under this order has been inspected and tested and found in conformance with applicable specifications forming a part of the description set forth in Kaiser's sales acknowledgement form. Any warranty is limited to that shown on Kaiser's general terms and conditions of sale. Test reports are on file, subject to examination.

JOSEPH AMES, QUALITY MANAGER



Plant Serial: 00015006  
Kaiser Order Number: 320897  
Line Item: 001

C



# KAISER ALUMINUM FABRICATED PRODUCTS

*Best in Class*

## CERTIFIED TEST REPORT

<http://Online.KaiserAluminum.com>

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
6573 W. WILLIS ROAD  
CHANDLER, AZ 85226

CUSTOMER PO NUMBER: M49360917-1		CUSTOMER PART NUMBER: 42588		PRODUCT DESCRIPTION: Drawn Seamless Tube/Pipe	
KAISER ORDER NUMBER: 221973	LINE ITEM: 001	SHIP DATE: 12/05/2016	KAISER LOT NUMBER: F00229976	ALLOY: 6061	TEMPER: T6
WEIGHT SHIPPED: 239.000 LB	QUANTITY: 86.000 PCS	B/L NUMBER: 223667	DIAM/DAF/THKNS: 9.00	WIDTH:	LENGTH: 12.000 FT
SHIP TO: TW METALS INC 27 ENGLEHARD DRIVE EXIT 8A OFF NJ TPK MONROE TWP, NJ 08831 USA			SOLD TO: TW METALS INC 760 CONSTITUTION DRIVE SUITE 204 EXTON, PA 19341 USA		

### Actual Physical Properties

REFERENCE	DASH#	SAMPLE#	UTS (KSI)	YTS (KSI)	ELONG%	HARDNESS	CON% IACS	BEND
F00229976	0001	1	46.9	40.5	17.5	N/A	N/A	N/A

### Chemical Composition (wt%), Aluminum Remainder

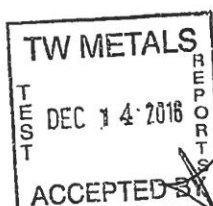
LIMITS	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Bi	Zr	Ea	Tot
Maximum	0.80	0.70	0.40	0.15	1.20	0.35	0.25	0.15	NA	NA	NA	0.05	0.15
Minimum	0.40	0.00	0.15	0.00	0.80	0.04	0.00	0.00	NA	NA	NA	0.00	0.00
D76008	.59	.26	.22	.04	1.00	.10	.05	.02	.00	.00	.00	.01	.02

### Applicable Requirements:

Description: OD: 0.6250"; Wall: 0.1250"; Round @  
AMS4082P AMS-WW-T-700/6C ASTM B210-12 WW-T-700/6F  
WE TAKE EXCEPTION TO PARA. 5.2.1., Per AMS-4082P, WAS NOT OILED.  
This Product Complies to FAR BAA, DFARS BAA, FAR TAA  
COMPLIES TO DIN EN 10204 JAN 2005  
No Weld Repair. Mercury Free.

### Miscellaneous Notes

MANUFACTURED IN USA MELTED IN USA  
MATERIAL COMPLIES WITH FAR BAA (FAR 52.225-1, BUY AMERICAN ACT- SUPPLIES), DFARS BAA  
(DFARS 252.225-7001 BUY AMERICAN ACT & BAL OF PAYMENTS PROG), AND FAR TAA (FAR 52.225-5  
TRADE AGREEMENTS).



Plant Serial: 00023570  
Kaiser Order Number: 221973  
Line Item: 001

**KAISER**  
**ALUMINUM**  
**FABRICATED PRODUCTS**

*Best in Class*

**CERTIFIED TEST REPORT**

<http://Online.KaiserAluminum.com>

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
6573 W. WILLIS ROAD  
CHANDLER, AZ 85226

**CERTIFICATION**

Kaiser Aluminum Fabricated Products, LLC ('Kaiser') hereby certifies that metal shipped under this order has been inspected and tested and found in conformance with the applicable specifications forming a part of the description set forth in Kaiser's sales acknowledgement form. Any warranty is limited to that shown on Kaiser's general terms & conditions of sale. Test reports are on file subject to examination.

Hans Kattentidt, Quality Manager

*[Signature]*

**CERTIFIED TEST REPORT**

CUSTOMER PURCHASE ORDER NO. M 49367859 LINE 001	CUST. ORD. NO. 450154	PRECISION TUBE P/N 24A031250580005
<b>SOLD:</b> TW METALS <b>TO</b> 175 TUBEWAY FOREST PARK, GA 30298 UNITED STATES	<b>SHIP:</b> TW METALS <b>TO</b> 175 TUBEWAY FOREST PARK, GA 30298 UNITED STATES	

QUANTITY ORD.	DESCRIPTION	QTY. SHIPPED	DATE SHIPPED
2508 FT  DAS 8 9-89	METAL - 6061 ALUM TEMPER - T6 SPEC - AMS 4082P ASTM-B-210-12 AMS-WW-T-700/6C LENGTH - 12 FT LGTH TOL +.1250 IN -.0000 IN SHAPE - ROUND FINISH - STRAIGHT EXACT LENGTHS OD .3125 +.0030 -.0030 ID WALL .0580 +.0040 -.0040	2760 FT	04/19/17

**MECHANICAL PROPERTIES**

SAMPLE #	TENSILE STRENGTH (P.S.I.)	YIELD STRENGTH (P.S.I.)	ELONGATION IN 2 INCHES (%)	ROCKWELL HARDNESS	AVERAGE GRAIN SIZE (MM.)
1	46,389	41,988	14		

**DESTRUCTIVE TESTS**

Comments: FAR BAA COMPLIES, DFARS BAA COMPLIES, FAR TAA COMPLIES

**NON-DESTRUCTIVE TESTS**

EDDY CURRENT: PASS

TEST REPORTS  
ACCEPTED BY

*[Signature]*  
APR 27 2017  
49367859  
TW METALS

**CHEMICAL COMPOSITION**

ALLOY: 6061		HEAT:		TRACEABILITY #: 1892697					
				RAW MATL VENDOR: PTC10471 - KAISER ALUMINUM					
	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Al
Min	0.40		0.15		0.80	0.04			Rem.
Max	0.80	0.70	0.40	0.15	1.20	0.35	0.25	0.15	
OTHER ELEMENTS: 0.05 MAX EACH / 0.15 MAX TOTAL									

We hereby certify that the material has been manufactured and tested in accordance with the requirements of the applicable specifications and descriptions set forth on Precision Tube's sales acknowledgement. During the manufacturing, testing and inspection, the product did not come into direct contact with mercury or any of its compounds, nor with any mercury containing device employing a single boundary containment. Test results indicate that the material is compliant with the current revision of the RoHS Directive (2011/65/EU).

# KAISER ALUMINUM FABRICATED PRODUCTS

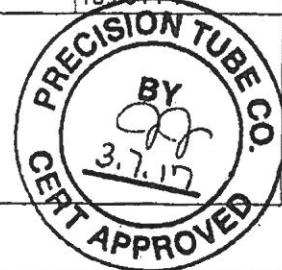
*Best in Class*

## CERTIFIED TEST REPORT

<http://Online.KaiserAluminum.com>

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
2425 STEVENS DRIVE  
RICHLAND, WA 99352

CUSTOMER PO NUMBER: PTC10471		CUSTOMER PART NUMBER: SPIRIT-371850		PRODUCT DESCRIPTION: 5.400 LB/PC .500 LB/0 LB 1.312 OD X .085 WALL ESRT	
KAISER ORDER NUMBER: 321435	LINE ITEM: 001	SHIP DATE: 03/03/2017	KAISER LOT NUMBER: 50751-355	ALLOY: 6061	TEMPER: O
WEIGHT SHIPPED: 5643.000 LB	QUANTITY: 998.000 PCS	B/L NUMBER: 005283	DIAM/DAF/THKNS:	WIDTH:	LENGTH: 13.984 FT
SHIP TO:  PRECISION TUBE CO 287 WISSAHICKON AVENUE N. WALES, PA 19454 USA			SOLD TO:  MUELLER INDUSTRIES, INC PRECISION TUBE 8285 TOURNAMENT DRIVE STE. 150 MEMPHIS, TN 38125 USA		



### Actual Physical Properties

REFERENCE	DA	HS	SAMPLE	UTS (KSI)	YTS (KSI)	%Elong in 2	HARDNESS	CONDUCT.	BEND
50751-355	0001		0001	16.6	6.1	27.3	N/A	N/A	N/A
50751-355	0001		0002	16.9	5.7	25.5	N/A	N/A	N/A
50751-355	0001		0003	16.9	5.6	27.7	N/A	N/A	N/A
50751-355	0001		0004	16.9	5.1	25.7	N/A	N/A	N/A
50751-355	0001		0005	17.6	6.0	26.3	N/A	N/A	N/A
50751-355	0001		0006	17.6	5.8	27.0	N/A	N/A	N/A

### Chemical Composition (wt%), Aluminum Remainder

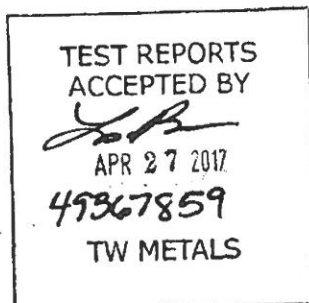
LIMITS	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Bi	Zr	Ea	Tot
Maximum	0.80	0.70	0.40	0.15	1.20	0.35	0.25	0.15	NA	NA	NA	0.05	.15
Minimum	0.40	0.00	0.15	0.00	0.80	0.04	0.00	0.00	NA	NA	NA	0.00	.0
A30067	.60	.23	.22	.04	.96	.07	.03	.03	.00	.00	.00	.01	.02
F76520	.60	.30	.20	.05	.97	.09	.07	.03	.00	.00	.00	.01	.02
F83232	.58	.28	.27	.05	.99	.06	.04	.02	.00	.00	.01	.01	.02
F83272	.64	.28	.22	.05	1.00	.10	.08	.03	.00	.00	.00	.01	.02

### Applicable Requirements:

ASTM-B241-16 NON-STENCILED ASTM-B221-14 ASTM-B345-11 AMS-QQ-A-200/8A TYPE I  
UNS#A96061 Also conforms to EN 10204 3.1

### Miscellaneous Notes

MANUFACTURED IN USA MELTED IN USA  
MERCURY IS NOT A NORMAL BACKGROUND ELEMENT IN ALUMINUM ALLOYS. NEITHER MERCURY NOR ANY OF ITS COMPOUNDS ARE UTILITIZED BY KAISER ALUMINUM IN THE MANUFACTURE OF THIS MATERIAL.



**KAISER**  
**ALUMINUM**  
**FABRICATED PRODUCTS**

*Best in Class*

**CERTIFIED TEST REPORT**

<http://Online.KaiserAluminum.com>

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
2425 STEVENS DRIVE  
RICHLAND, WA 99352

**CERTIFICATION**

Kaiser Aluminum Fabricated Products, LLC hereby certifies that metal shipped under this order has been inspected and tested and found in conformance with applicable specifications forming a part of the description set forth in Kaiser's sales acknowledgement form. Any warranty is limited to that shown on Kaiser's general terms and conditions of sale. Test reports are on file, subject to examination.

JOSEPH AMES, QUALITY MANAGER

*J. Ames*

TEST REPORTS  
ACCEPTED BY

*J. Ames*  
APR 27 2017

TW METALS



PRECISION TUBE CO.  
287 WISSAHICKON AVE.  
NORTH WALES PA 19454

Control No: 1604

**CERTIFIED TEST REPORT**

CUSTOMER PURCHASE ORDER NO.	CUST. ORD. NO.	PRECISION TUBE P/N
49354489 LINE 001	422327	24A031250580005

**SOLD:** TW METALS  
**TO** 175 TUBEWAY  
FOREST PARK, GA 30298  
UNITED STATES

**SHIP:** TW METALS  
**TO** 175 TUBEWAY  
FOREST PARK, GA 30298  
UNITED STATES

QUANTITY ORD.	DESCRIPTION	QTY. SHIPPED	DATE SHIPPED
1824 FT  DAS 9 9-89	METAL - 6061 ALUM TEMPER - T6 SPEC - AMS 4082P ASTM-B-210-12 AMS-WW-T-700/6C LENGTH - 12 FT LGTH TOL +.1250 IN -.0000 IN SHAPE - ROUND FINISH - STRAIGHT EXACT LENGTHS OD .3125 +.0030 -.0030 ID WALL .0580 +.0040 -.0040	2004 FT	08/05/16

**MECHANICAL PROPERTIES**

SAMPLE #	TENSILE STRENGTH (P.S.I.)	YIELD STRENGTH (P.S.I.)	ELONGATION IN 2 INCHES (%)	ROCKWELL HARDNESS	AVERAGE GRAIN SIZE (MM.)
1	45,775	40,439	17		

**TEST REPORTS**

**DESTRUCTIVE TESTS**

**ACCEPTED BY**

Comments: FAR BAA COMPLIES, DFARS BAA COMPLIES, FAR TAA COMPLIES

49354489  
AUG 09 2016

*Signature*  
**TW METALS**

**NON-DESTRUCTIVE TESTS**

EDDY CURRENT: PASS

**CHEMICAL COMPOSITION**

ALLOY: 6061		HEAT:		TRACEABILITY #: 388604					
				RAW MATL VENDOR: PTC2249 - Kaiser Aluminum					
	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Al
Min	0.40		0.15		0.80	0.04			Rem.
Max	0.80	0.70	0.40	0.15	1.20	0.35	0.25	0.15	
OTHER ELEMENTS: 0.05 MAX EACH / 0.15 MAX TOTAL									

We hereby certify that the material has been manufactured and tested in accordance with the requirements of the applicable specifications and descriptions set forth on Precision Tube's sales acknowledgement. During the manufacturing, testing and inspection, the product did not come into direct contact with mercury or any of its compounds, nor with any mercury containing device employing a single boundary containment. Test results indicate that the material is compliant with the current revision of the RoHS Directive (2011/65/EU).

Melted and Manufactured in USA  
QMS Registered to ISO 9001: 2008

By: *Art Onaitis*

Art Onaitis  
QA Manager

08/05/16

Page: 1 of 1

# KAISER ALUMINUM

FABRICATED PRODUCTS

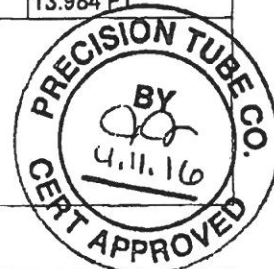
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## CERTIFIED TEST REPORT

<http://Online.KaiserAluminum.com>

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
2425 STEVENS DRIVE  
RICHLAND, WA 99352

CUSTOMER PO NUMBER: <b>PTC2249</b>		CUSTOMER PART NUMBER: <b>SPIRIT-371850</b>		PRODUCT DESCRIPTION: <b>5.400 LB/PC .500 LB/-0 LB 1.312 OD X .085 WALL ESRT</b>	
KAISER ORDER NUMBER: <b>320031</b>	LINE ITEM: <b>001</b>	SHIP DATE: <b>04/01/2016</b>	KAISER LOT NUMBER: <b>50751-323</b>	ALLOY: <b>6061</b>	TEMPER: <b>O</b>
WEIGHT SHIPPED: <b>16135.000 LB</b>	QUANTITY: <b>2913.000 PCS</b>	B/L NUMBER: <b>004991</b>	DIAM/DAF/THKNS: <b></b>	WIDTH: <b></b>	LENGTH: <b>13.984 FT</b>
SHIP TO:  <b>PRECISION TUBE CO 287 WISSAHICKON AVENUE N. WALES, PA 19454 USA</b>			SOLD TO:  <b>MUELLER INDUSTRIES, INC PRECISION TUBE 8285 TOURNAMENT DRIVE STE. 150 MEMPHIS, TN 38125 USA</b>		



### Actual Physical Properties

REFERENCE	DASH#	SAMPLE#	UTS(KSI)	YTS(KSI)	%Elong in 2	HARDNESS	CONDUCT.	BEND
50751-323	0001	0002	17.3	5.9	26.7	NA N/A	N/A	N/A
50751-323	0001	0003	17.3	5.9	26.7	NA N/A	N/A	N/A
50751-323	0001	0004	17.3	5.4	27.2	NA N/A	N/A	N/A
50751-323	0001	0005	18.0	6.1	28.0	NA N/A	N/A	N/A
50751-323	0001	0006	17.4	5.7	26.4	NA N/A	N/A	N/A
50751-323	0001	0007	17.9	6.2	27.6	NA N/A	N/A	N/A
50751-323	0001	0008	17.5	5.8	26.6	NA N/A	N/A	N/A
50751-323	0001	0009	17.7	5.7	28.6	NA N/A	N/A	N/A
50751-323	0001	0010	16.9	5.6	25.2	NA N/A	N/A	N/A
50751-323	0001	0011	17.6	5.8	27.9	NA N/A	N/A	N/A
50751-323	0001	0012	17.8	6.9	27.4	NA N/A	N/A	N/A
50751-323	0001	0013	18.1	6.1	27.2	NA N/A	N/A	N/A
50751-323	0001	0014	17.4	5.7	28.3	NA N/A	N/A	N/A
50751-323	0001	0015	17.0	5.6	28.6	NA N/A	N/A	N/A
50751-323	0001	0016	18.2	5.8	26.6	NA N/A	N/A	N/A

### Chemical Composition (wt%), Aluminum Remainder

LIMITS	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Bi	Zr	Ea	Tot
Maximum	0.80	0.70	0.40	0.15	1.20	0.35	0.25	0.15	NA	NA	NA	0.05	.15
Minimum	0.40	0.00	0.15	0.00	0.80	0.04	0.00	0.00	NA	NA	NA	0.00	.0
F75366	.58	.29	.22	.06	.98	.08	.05	.02	.00	.00	.00	.01	.02

### Applicable Requirements:

ASTM-B241-12 NON-STENCILED ASTM-B221-13 ASTM-B345-11 AMS-QQ-A-200/8 97(R07) TYPE I  
UNS#A96061 Also conforms to EN 10204 3.1

TEST REPORTS  
ACCEPTED BY  
49354489  
AUG 09 2016  
*[Signature]*  
TW METALS

Plant Serial: 00013829  
Kaiser Order Number: 320031  
Line Item: 001

**KAISER**  
**ALUMINUM**  
**FABRICATED PRODUCTS**

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**CERTIFIED TEST REPORT**

<http://Online.KaiserAluminum.com>

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
2425 STEVENS DRIVE  
RICHLAND, WA 99352

**Miscellaneous Notes**

MANUFACTURED IN USA MELTED IN USA  
MERCURY IS NOT A NORMAL BACKGROUND ELEMENT IN ALUMINUM ALLOYS. NEITHER MERCURY NOR ANY  
OF ITS COMPOUNDS ARE UTILIZED BY KAISER ALUMINUM IN THE MANUFACTURE OF THIS MATERIAL.

**CERTIFICATION**

Kaiser Aluminum Fabricated Products, LLC hereby certifies that metal shipped under this order has been inspected and tested and found in conformance with applicable specifications forming a part of the description set forth in Kaiser's sales acknowledgement form. Any warranty is limited to that shown on Kaiser's general terms and conditions of sale. Test reports are on file, subject to examination.

JOSEPH AMES, QUALITY MANAGER

*Jph*

**TEST REPORTS  
ACCEPTED BY**

AUG 09 2016

*Lab*  
**TW METALS**

Plant Serial: 00013829  
Kaiser Order Number: 320031  
Line Item: 001



# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: M304TRO.375W.065

PO / BATCH NO.: 0336183/M137477

DATE: MAY 12 2017

MATERIAL CERT REC'D: yes  
 QUANTITY RECEIVED: 20'  
 QUANTITY INSPECTED: 20'  
 QUANTITY REJECTED: 0

THICKNESS ORDERED: .065  
 THICKNESS RECEIVED: .065  
 SHEET SIZE ORDERED: N/A  
 SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)	COMMENTS
SURFACE DAMAGE	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT FINISH	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORROSION	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT GRAIN DIRECTION	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT MATERIAL	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT THICKNESS	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
PHOTO REQUIRED	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT MATERIAL	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT REF # TO LINK CERT	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT MATERIAL IDENTIFICATION	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT M# ON THE MATERIAL	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. RECORD RESULTS BELOW				
	HRC	HRB	DUR A	DUR D
TYPE OF MATERIAL				
SIZE OF TEST SAMPLE				
HARDNESS / DUROMETER READING				

*testers located in the Quality Office*

QC 18 INSPECTION

ENGINEERING SIGNOFF (if required)

INSPECTED BY: CB

SIGNED OFF BY: \_\_\_\_\_

DATE: MAY 12 2017

DATE: \_\_\_\_\_

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: M3047Ro, 750w049

PO / BATCH NO.: D36183/M137477

DATE: MAY 12 2017

MATERIAL CERT REC'D: yes

THICKNESS ORDERED: .049

QUANTITY RECEIVED: 60'

THICKNESS RECEIVED: .045

QUANTITY INSPECTED: 60'

SHEET SIZE ORDERED: N/A

QUANTITY REJECTED: 0

SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)	COMMENTS
SURFACE DAMAGE	Y <input checked="" type="checkbox"/>	
CORRECT FINISH	<input checked="" type="checkbox"/> N	
CORROSION	Y <input checked="" type="checkbox"/>	
CORRECT GRAIN DIRECTION	<input checked="" type="checkbox"/> N	
CORRECT MATERIAL	<input checked="" type="checkbox"/> N	
CORRECT THICKNESS	<input checked="" type="checkbox"/> N	
PHOTO REQUIRED	Y <input checked="" type="checkbox"/>	
CORRECT MATERIAL	<input checked="" type="checkbox"/> N	ASMT. A269
CORRECT REF # TO LINK CERT	<input checked="" type="checkbox"/> N	HT # YX1501783
CORRECT MATERIAL IDENTIFICATION	<input checked="" type="checkbox"/> N	
CORRECT M# ON THE MATERIAL	<input checked="" type="checkbox"/> N	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y <input checked="" type="checkbox"/>	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y <input checked="" type="checkbox"/>	

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. RECORD RESULTS BELOW				
TYPE OF MATERIAL	HRC	HRB	DUR A	DUR D
SIZE OF TEST SAMPLE				
HARDNESS / DUROMETER READING				

*testers located in the Quality Office*

<b>QC 18 INSPECTION</b>		<b>ENGINEERING SIGNOFF (if required)</b>	
INSPECTED BY: <u>CB</u>	DATE: <u>MAY 12 2017</u>	SIGNED OFF BY: _____	DATE: _____

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in:

# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: M4130N+0.500W.083  
 DATE: MAY 12 2017

PO / BATCH NO.: 1036183/M137477

MATERIAL CERT REC'D: yes  
 QUANTITY RECEIVED: 40'  
 QUANTITY INSPECTED: 40'  
 QUANTITY REJECTED: 0

THICKNESS ORDERED: .083  
 THICKNESS RECEIVED: .083  
 SHEET SIZE ORDERED: N/A  
 SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)	COMMENTS
SURFACE DAMAGE	Y <input checked="" type="checkbox"/>	
CORRECT FINISH	<input checked="" type="checkbox"/> N	
CORROSION	Y <input checked="" type="checkbox"/>	
CORRECT GRAIN DIRECTION	<input checked="" type="checkbox"/> N	
CORRECT MATERIAL	<input checked="" type="checkbox"/> N	
CORRECT THICKNESS	<input checked="" type="checkbox"/> N	
PHOTO REQUIRED	Y <input checked="" type="checkbox"/>	
CORRECT MATERIAL	<input checked="" type="checkbox"/> N	AMS 6360
CORRECT REF # TO LINK CERT	<input checked="" type="checkbox"/> N	HT # 253636
CORRECT MATERIAL IDENTIFICATION	<input checked="" type="checkbox"/> N	
CORRECT M# ON THE MATERIAL	<input checked="" type="checkbox"/> N	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y <input checked="" type="checkbox"/>	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y <input checked="" type="checkbox"/>	

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. RECORD RESULTS BELOW				
TYPE OF MATERIAL	HRC	HRB	DUR A	DUR D
SIZE OF TEST SAMPLE				
HARDNESS / DUROMETER READING				

testers located in the Quality Office

<b>QC 18 INSPECTION</b>	<b>ENGINEERING SIGNOFF (if required)</b>
INSPECTED BY: <u>CB</u> DATE: <u>MAY 12 2017</u>	SIGNED OFF BY: _____ DATE: _____

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in:

# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: M4130 NTO.750W.049  
 DATE: MAY 12 2017

PO / BATCH NO.: PO36183/M137477

MATERIAL CERT REC'D: yes  
 QUANTITY RECEIVED: 24'  
 QUANTITY INSPECTED: 24'  
 QUANTITY REJECTED: 0

THICKNESS ORDERED: .049  
 THICKNESS RECEIVED: .047  
 SHEET SIZE ORDERED: N/A  
 SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)	COMMENTS
SURFACE DAMAGE	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT FINISH	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORROSION	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT GRAIN DIRECTION	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT MATERIAL	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT THICKNESS	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
PHOTO REQUIRED	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT MATERIAL	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	AMS 6360
CORRECT REF # TO LINK CERT	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	HT # 251554
CORRECT MATERIAL IDENTIFICATION	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
CORRECT M# ON THE MATERIAL	Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/>	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y <input checked="" type="checkbox"/>	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y <input checked="" type="checkbox"/>	

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. RECORD RESULTS BELOW				
	HRC	HRB	DUR A	DUR D
TYPE OF MATERIAL				
SIZE OF TEST SAMPLE				
HARDNESS / DUROMETER READING				

*testers located in the Quality Office*

QC 18 INSPECTION	ENGINEERING SIGNOFF (if required)
INSPECTED BY: <u>CB</u> DATE: <u>MAY 12 2017</u>	SIGNED OFF BY: _____ DATE: _____

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in:

# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: M606H6T0.375W058

PO / BATCH NO.: 036183/M137477

DATE: MAY 12 2017

MATERIAL CERT REC'D: YES

THICKNESS ORDERED: .058

QUANTITY RECEIVED: 204

THICKNESS RECEIVED: .058

QUANTITY INSPECTED: 204

SHEET SIZE ORDERED: N/A

QUANTITY REJECTED: 0

SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)	COMMENTS
SURFACE DAMAGE	Y <input checked="" type="radio"/> N	
CORRECT FINISH	Y <input checked="" type="radio"/> N	
CORROSION	Y <input checked="" type="radio"/> N	
CORRECT GRAIN DIRECTION	Y <input checked="" type="radio"/> N	
CORRECT MATERIAL	Y <input checked="" type="radio"/> N	
CORRECT THICKNESS	Y <input checked="" type="radio"/> N	
PHOTO REQUIRED	Y <input checked="" type="radio"/> N	
CORRECT MATERIAL	Y <input checked="" type="radio"/> N	ASTM B210
CORRECT REF # TO LINK CERT	Y <input checked="" type="radio"/> N	HF #1180968
CORRECT MATERIAL IDENTIFICATION	Y <input checked="" type="radio"/> N	
CORRECT M# ON THE MATERIAL	Y <input checked="" type="radio"/> N	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y <input checked="" type="radio"/> N	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y <input checked="" type="radio"/> N	

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. RECORD RESULTS BELOW				
	HRC	HRB	DUR A	DUR D
TYPE OF MATERIAL				
SIZE OF TEST SAMPLE				
HARDNESS / DUROMETER READING				

*testers located in the Quality Office*

**QC 18 INSPECTION**

**ENGINEERING SIGNOFF (if required)**

INSPECTED BY: CB <sup>DAS</sup>  
9

SIGNED OFF BY: \_\_\_\_\_

DATE: MAY 12 2017

DATE: \_\_\_\_\_

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: MG617670.025w.125  
 DATE: MAY 12 2017

PO / BATCH NO.: 0030183/M137477

MATERIAL CERT REC'D: yes  
 QUANTITY RECEIVED: 24'  
 QUANTITY INSPECTED: 24'  
 QUANTITY REJECTED: 0

THICKNESS ORDERED: .125  
 THICKNESS RECEIVED: .125  
 SHEET SIZE ORDERED: N/A  
 SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)	COMMENTS
SURFACE DAMAGE	Y <input checked="" type="checkbox"/> N	
CORRECT FINISH	Y <input checked="" type="checkbox"/> N	
CORROSION	Y <input checked="" type="checkbox"/> N	
CORRECT GRAIN DIRECTION	Y <input checked="" type="checkbox"/> N	
CORRECT MATERIAL	Y <input checked="" type="checkbox"/> N	
CORRECT THICKNESS	Y <input checked="" type="checkbox"/> N	
PHOTO REQUIRED	Y <input checked="" type="checkbox"/> N	
CORRECT MATERIAL	Y <input checked="" type="checkbox"/> N	ASTM B210
CORRECT REF # TO LINK CERT	Y <input checked="" type="checkbox"/> N	HT # F00229976
CORRECT MATERIAL IDENTIFICATION	Y <input checked="" type="checkbox"/> N	
CORRECT M# ON THE MATERIAL	Y <input checked="" type="checkbox"/> N	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y <input checked="" type="checkbox"/> N	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y <input checked="" type="checkbox"/> N	

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. RECORD RESULTS BELOW				
	HRC	HRB	DUR A	DUR D
TYPE OF MATERIAL				
SIZE OF TEST SAMPLE				
HARDNESS / DUROMETER READING				

*testers located in the Quality Office*

QC 18 INSPECTION

ENGINEERING SIGNOFF (if required)

INSPECTED BY: CB

SIGNED OFF BY: \_\_\_\_\_

DATE: MAY 12 2017

DATE: \_\_\_\_\_

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: M66176+0.3125W.058  
 DATE: MAY 12 2017

PO / BATCH NO.: P036183/M/37477

MATERIAL CERT REC'D: yes  
 QUANTITY RECEIVED: 120'  
 QUANTITY INSPECTED: 120'  
 QUANTITY REJECTED: 0

THICKNESS ORDERED: .058  
 THICKNESS RECEIVED: .055  
 SHEET SIZE ORDERED: N/A  
 SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)	COMMENTS
SURFACE DAMAGE	Y <input checked="" type="radio"/> N <input type="radio"/>	
CORRECT FINISH	Y <input type="radio"/> N <input checked="" type="radio"/>	
CORROSION	Y <input type="radio"/> N <input checked="" type="radio"/>	
CORRECT GRAIN DIRECTION	Y <input type="radio"/> N <input checked="" type="radio"/>	
CORRECT MATERIAL	Y <input type="radio"/> N <input checked="" type="radio"/>	
CORRECT THICKNESS	Y <input type="radio"/> N <input checked="" type="radio"/>	
PHOTO REQUIRED	Y <input type="radio"/> N <input checked="" type="radio"/>	
CORRECT MATERIAL	Y <input type="radio"/> N <input checked="" type="radio"/>	
CORRECT REF # TO LINK CERT	Y <input type="radio"/> N <input checked="" type="radio"/>	
CORRECT MATERIAL IDENTIFICATION	Y <input type="radio"/> N <input checked="" type="radio"/>	
CORRECT M# ON THE MATERIAL	Y <input type="radio"/> N <input checked="" type="radio"/>	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y <input type="radio"/> N <input checked="" type="radio"/>	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y <input type="radio"/> N <input checked="" type="radio"/>	

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. RECORD RESULTS BELOW				
	HRC	HRB	DUR A	DUR D
TYPE OF MATERIAL				
SIZE OF TEST SAMPLE				
HARDNESS / DUROMETER READING				

*testers located in the Quality Office*

**QC 18 INSPECTION**

**ENGINEERING SIGNOFF (if required)**

INSPECTED BY: CB <sup>9</sup><sub>9-89</sub>  
 DATE: MAY 12 2017

SIGNED OFF BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in.





Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO36183

Purchase Order Date 5/3/2017

PO Print Date 5/4/2017

Page Number 1 of 5

Order From :  
TW METALS  
PO BOX 933014  
ALTANTA, GA 31193-3014  
US

VU-TWM001

Ship To : DART AEROSPACE LTD  
1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

E-MAILED  
MAY 04 2017

REVISED

Contact Name  
Vendor Phone 585 768 5600  
  
Ship To Contact  
Ship To Phone  
Ship Via: YRC COLLECT  
Ship Acct:

Buyer  
Customer POID  
Customer Tax # 10127-2607  
Terms Net 30  
Currency USD  
FOB FCA - (Free Carrier)

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
1	M304TR0.375W.065 ✓	304 RD Tube .375 x .065W	5/9/2017 Yes 5/9/2017		20.00 f	\$1.86	\$37.21
MATERIAL: AISI 304/316 SA SEAMLESS ROUND TUBING AS PER ASTM A213 OR AMSE SA213 OR ASTM A269 DAS 9 9-89							Line Total: \$37.21
2	M304TR0.750W.049 ✓	304 RD Tube .750 x .049W	5/9/2017 Yes 5/9/2017		60.00 f	\$2.10	\$126.00
MATERIAL: AISI 304/316 SA SEAMLESS ROUND TUBING AS PER ASTM A213 OR AMSE SA213 OR ASTM A269 DAS 9-89							Line Total: \$126.00

SP17-5-9.

Note:

5/4/2017



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO36183

Purchase Order Date 5/3/2017

PO Print Date 5/4/2017

Page Number 2 of 5

**Order From :**

VU-TWM001

**Ship To :** DART AEROSPACE LTD

TW METALS  
PO BOX 933014  
ALTANTA, GA 31193-3014  
US

1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

**Contact Name**

**Vendor Phone**

585 768 5600

**Ship To Contact**

**Ship To Phone**

**Ship Via:**

YRC COLLECT

**Ship Acct:**

**Buyer**

Chantal Lavoie

**Customer POID**

**Customer Tax #**

10127-2607

**Terms**

Net 30

**Currency**

USD

**FOB**

FCA - (Free Carrier)

3	M4130NT0.500W.083	4130 RD tube .500 x .083W	5/9/2017	40.00	\$4.00	\$160.00
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Yes

5/9/2017

f

MATERIAL: AISI 4130N SEAMLESS STEEL TUBING  
AS PER MIL-T-6736 OR AMS 6371/6360/6361  
6362/6373/6374

DAS  
9  
9-89

*2x.  
recu 40-083.*

**Line Total:**

**\$160.00**

4	M4130NT0.750W.049	4130 RD Tube .750 x.049W	5/9/2017	20.00	\$6.00	\$120.00
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Yes

5/9/2017

f

MATERIAL: AISI 4130N SEAMLESS STEEL TUBING  
AS PER MIL-T-6736 OR AMS 6371/6360/6361  
6362/6373/6374

DAS  
9  
9-89

*23-917  
SP17-5-10 1x.*

**Line Total:**

**\$120.00**

**Note:**

5/4/2017



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO36183

Purchase Order Date 5/3/2017

PO Print Date 5/4/2017

Page Number 3 of 5

Order From :  
TW METALS  
PO BOX 933014  
ALTANTA, GA 31193-3014  
US

VU-TWM001

Ship To : DART AEROSPACE LTD  
1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

Contact Name  
Vendor Phone 585 768 5600

Ship To Contact  
Ship To Phone  
Ship Via: YRC COLLECT  
Ship Acct:

Buyer Chantal Lavoie  
Customer POID  
Customer Tax # 10127-2607  
Terms Net 30  
Currency USD  
FOB FCA - (Free Carrier)

5 M6061T6T0.375W.058 6061-T6 RD Tube .375 5/9/2017 200.00 \$2.15 \$430.00  
x.058W  
Yes  
5/9/2017

MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING  
AS PER WW-T-700/6 OR QQ-A-200/8 OR QQ-A-225/8 OR  
AMS 4080 OR AMS 4082 OR AMS 4083 OR ASTM B210 OR  
ASTM B241  
9  
9-89

f  
recy ft  
204 ft  
17x

Line Total: \$430.00

6 M6061T6T0.625W.125 6061-T6 RD Tube 0.625 5/9/2017 20.00 \$5.15 \$103.00  
X.125W  
Yes  
5/9/2017

MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING  
AS PER WW-T-700/6 OR QQ-A-200/8 OR QQ-A-225/8 OR  
AMS 4080 OR AMS 4082 OR AMS 4083 OR ASTM B210 OR  
ASTM B241  
9  
9-89

f  
recy ft  
24 ft

SP17-5-10

Line Total: \$103.00

Note:

5/4/2017



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO36183

Purchase Order Date 5/3/2017

PO Print Date 5/4/2017

Page Number 4 of 5

Order From :  
TW METALS  
PO BOX 933014  
ALTANTA, GA 31193-3014  
US

VU-TWM001

Ship To : DART AEROSPACE LTD  
1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

Contact Name  
Vendor Phone 585 768 5600

Ship To Contact  
Ship To Phone

Ship Via: YRC COLLECT  
Ship Acct:

Buyer Chantal Lavoie  
Customer POID  
Customer Tax # 10127-2607  
Terms Net 30  
Currency USD  
FOB FCA - (Free Carrier)

7	M6061T6T0.3125W.058	ALUM TUBE .3125 x .058w	5/9/2017	120.00	\$2.50	\$300.00
			Yes	f		
			5/9/2017			

MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING  
AS PER WW-T-700/6 OR QQ-A-200/8 OR QQ-A-225/8 OR  
AMS 4080 OR AMS 4082 OR AMS 4083 OR ASTM B210 OR  
ASTM B241

10x.  
17-5-10  
[Handwritten signature]

Line Total: \$300.00

8	M6061T6T0.750W.125	6061-T6 RD Tube .750 x .125W	5/23/2017	20.00	\$9.20	\$184.00
			Yes	f		
			5/23/2017			

MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING  
AS PER WW-T-700/6 OR QQ-A-200/8 OR QQ-A-225/8 OR  
AMS 4080 OR AMS 4082 OR AMS 4083 OR ASTM B210 OR  
ASTM B241

Line Total: \$184.00

Note:

5/4/2017



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO36183

Purchase Order Date 5/3/2017

PO Print Date 5/4/2017

Page Number 5 of 5

Order From :  
TW METALS  
PO BOX 933014  
ALTANTA, GA 31193-3014  
US

VU-TWM001

Ship To : DART AEROSPACE LTD  
1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

Contact Name  
Vendor Phone 585 768 5600  
  
Ship To Contact  
Ship To Phone  
Ship Via: YRC COLLECT  
Ship Acct:

Buyer  
Customer POID  
Customer Tax # 10127-2607  
Terms Net 30  
Currency USD  
FOB FCA - (Free Carrier)

9	71401-45	PROCUREMENT QUALITY CLAUSES	5/9/2017	1.00	\$0.00	\$0.00
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No

Procurement Quality Clauses  
A005 right of entry  
A012 chemical and physical test report  
A016 personnel qualification  
A017 raw material identification (as applicable)  
A026 certification of material conformance  
A041 quality management system  
A042 dart notification by supplier  
A043 retention of quality documents

5/9/2017

8217-510

Line Total: \$0.00

PO Total: \$1,460.21

RQ CL

Note: Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit [www.dartaerospace.com](http://www.dartaerospace.com) for further explanation.

Change Nbr: 3

Change Date: 5/4/2017